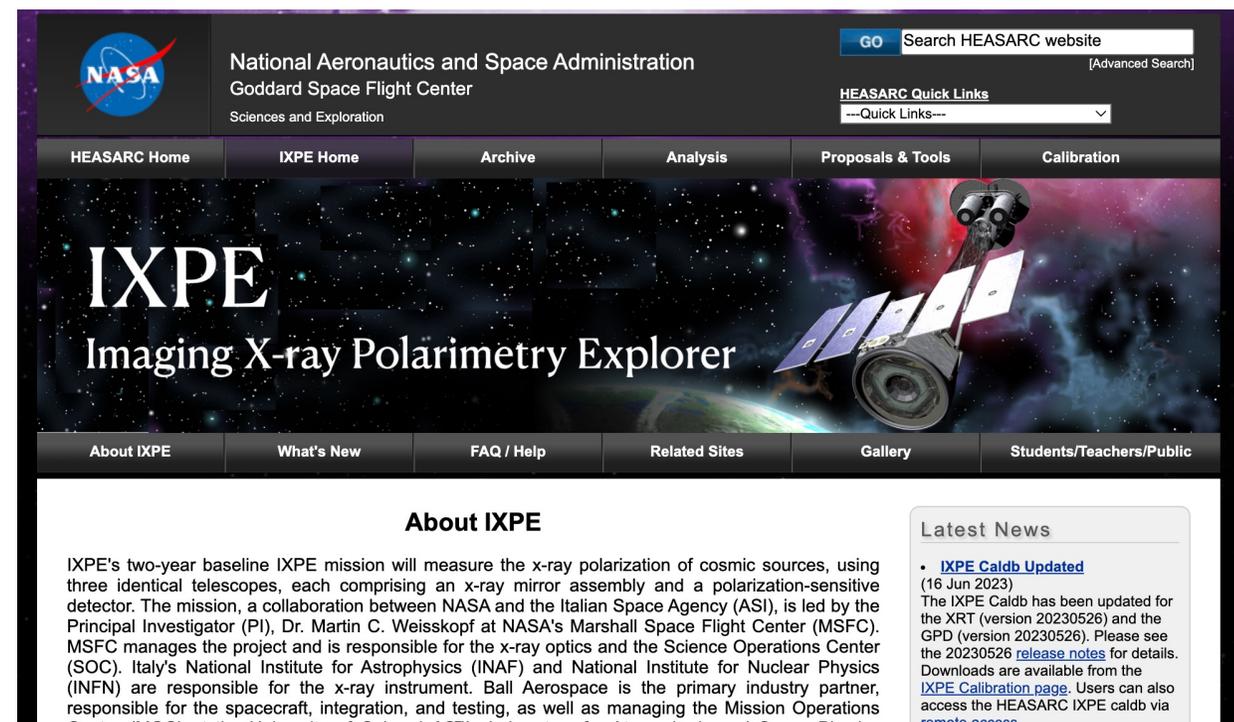




# IXPE General Observer (GO) Program Cycle 1

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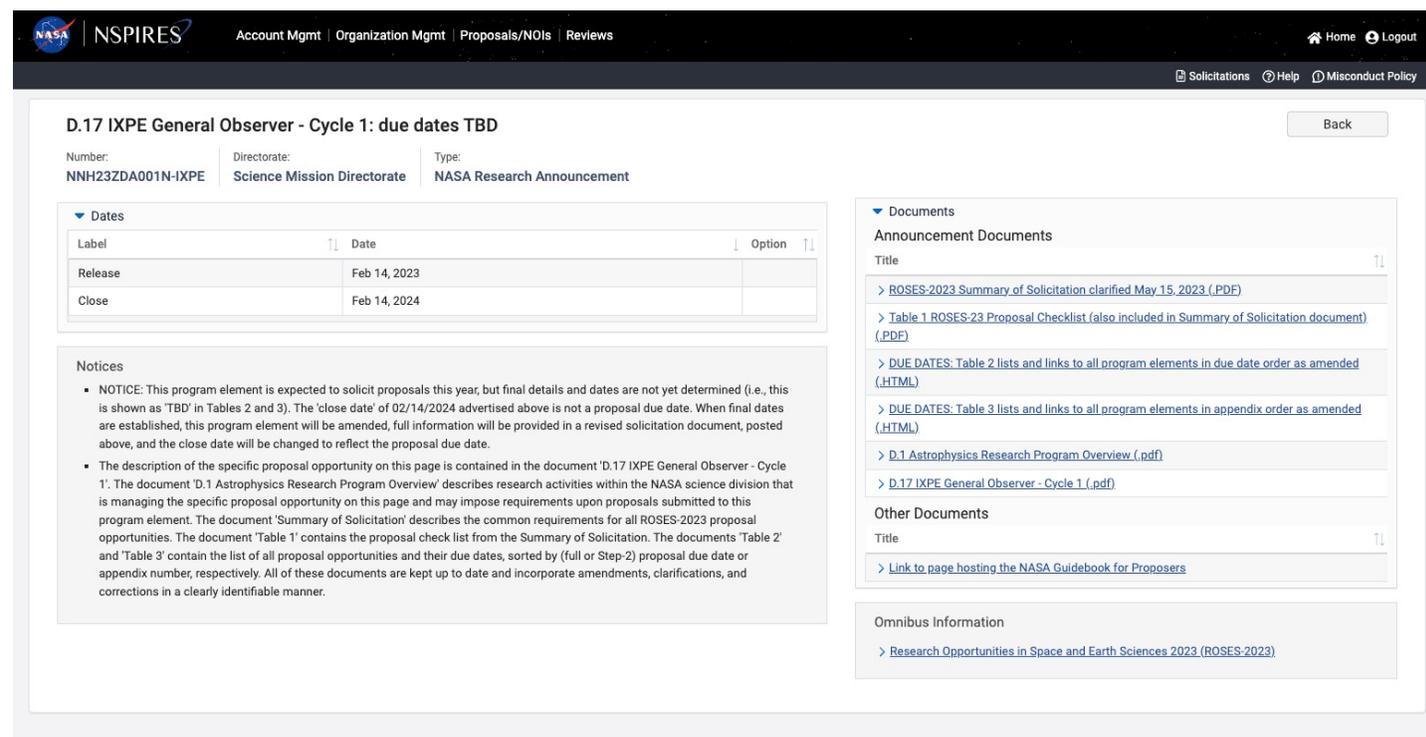
- IXPE extended past prime mission
- IXPE General Observer (GO) program
- General Observer Facility (GOF) at NASA GSFC
- GOF website:  
<https://heasarcdev.gsfc.nasa.gov/docs/ixpe/>



The screenshot shows the HEASARC website interface. At the top, there is a NASA logo and the text "National Aeronautics and Space Administration, Goddard Space Flight Center, Sciences and Exploration". A search bar is present with the text "GO Search HEASARC website" and a link to "[Advanced Search]". Below the search bar are "HEASARC Quick Links" and a dropdown menu labeled "--Quick Links--". A navigation menu includes links for "HEASARC Home", "IXPE Home", "Archive", "Analysis", "Proposals & Tools", and "Calibration". The main content area features a large image of the IXPE satellite in space with the text "IXPE Imaging X-ray Polarimetry Explorer". Below this are more navigation links: "About IXPE", "What's New", "FAQ / Help", "Related Sites", "Gallery", and "Students/Teachers/Public". The "About IXPE" section contains a detailed paragraph about the mission's goals and partners. A "Latest News" sidebar on the right highlights a recent update: "IXPE Caldb Updated (16 Jun 2023)", mentioning updates to the XRT and GPD software and providing links for release notes and calibration pages.

Event	Date
Proposal submission opens	June 2023
Non-mandatory NOI due	September 18 <sup>th</sup> , 2023
Phase I submission deadline	October 18 <sup>th</sup> , 2023
Results/ Phase II	January 2024
Cycle 1 GO observations start	February 2024

- Non-mandatory
- Helps GOF estimate number of proposals
- Strongly encouraged
- Submission through NSPIRES
- Sept 18<sup>th</sup> deadline!



**D.17 IXPE General Observer - Cycle 1: due dates TBD**

Number: NNH23ZDA001N-IXPE | Directorate: Science Mission Directorate | Type: NASA Research Announcement

Label	Date	Option
Release	Feb 14, 2023	
Close	Feb 14, 2024	

**Notices**

- NOTICE: This program element is expected to solicit proposals this year, but final details and dates are not yet determined (i.e., this is shown as 'TBD' in Tables 2 and 3). The 'close date' of 02/14/2024 advertised above is not a proposal due date. When final dates are established, this program element will be amended, full information will be provided in a revised solicitation document, posted above, and the close date will be changed to reflect the proposal due date.
- The description of the specific proposal opportunity on this page is contained in the document 'D.17 IXPE General Observer - Cycle 1'. The document 'D.1 Astrophysics Research Program Overview' describes research activities within the NASA science division that is managing the specific proposal opportunity on this page and may impose requirements upon proposals submitted to this program element. The document 'Summary of Solicitation' describes the common requirements for all ROSES-2023 proposal opportunities. The document 'Table 1' contains the proposal check list from the Summary of Solicitation. The documents 'Table 2' and 'Table 3' contain the list of all proposal opportunities and their due dates, sorted by (full or Step-2) proposal due date or appendix number, respectively. All of these documents are kept up to date and incorporate amendments, clarifications, and corrections in a clearly identifiable manner.

**Documents**

**Announcement Documents**

ROSES-2023 Summary of Solicitation clarified May 15, 2023 (.PDF)

Table 1 ROSES-23 Proposal Checklist (also included in Summary of Solicitation document) (.PDF)

DUE DATES: Table 2 lists and links to all program elements in due date order as amended (.HTML)

DUE DATES: Table 3 lists and links to all program elements in appendix order as amended (.HTML)

D.1 Astrophysics Research Program Overview (.pdf)

D.17 IXPE General Observer - Cycle 1 (.pdf)

**Other Documents**

Link to page hosting the NASA Guidebook for Proposers

**Omnibus Information**

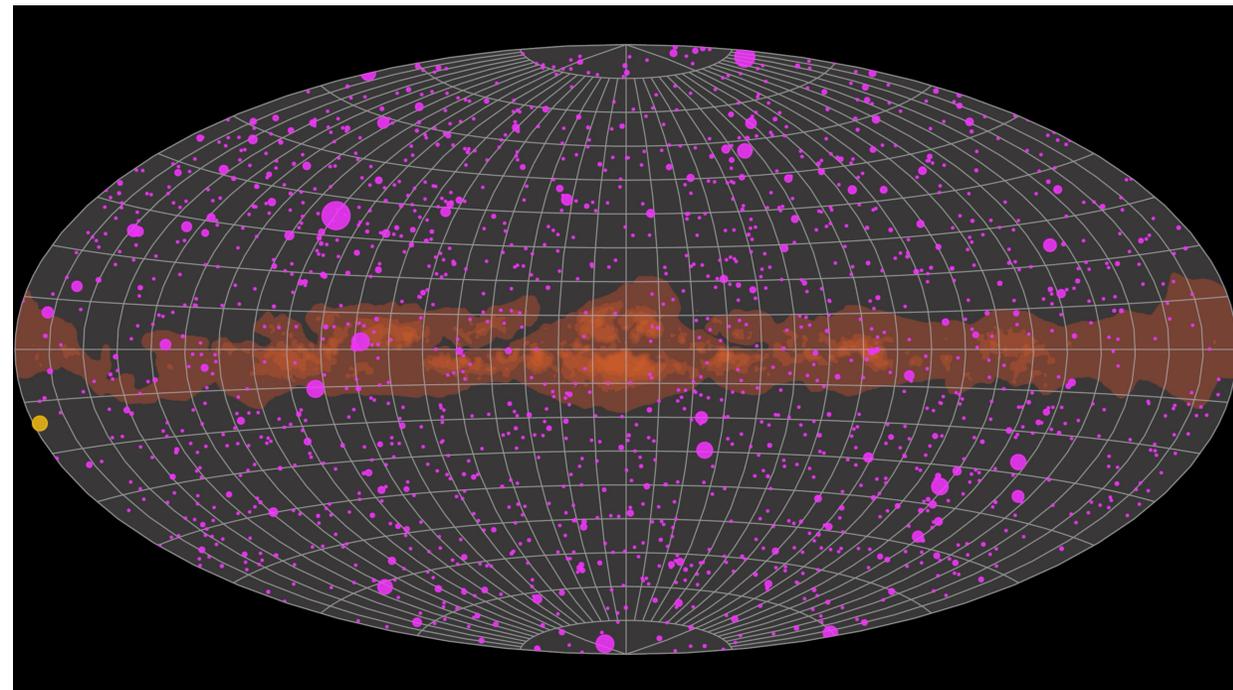
Research Opportunities in Space and Earth Sciences 2023 (ROSES-2023)

- Approximately 11 Msec observing time
- ~4 Msec for large proposals
- 300 ks joint NICER time
- Funding available (~\$3M)
- Anticipate awarding ~30-40 proposals
- Regular, Large and Theory proposals
- ToO proposals also solicited
- Can request up to 6 months exclusive-use

- Phase dependent and time constrained observations allowed
- Can request up to 5 observations of a target
- Maximum of 6 targets can be listed

- ~4 Msec for large program (LP)
- All proposals requesting over 1.5 Msec considered large
- No exclusive use period for LP

- ToO proposals for known targets
- Maximum of 6 potential targets
- Multiple triggers allowed per proposal (max 5)
- Max. exposure for individual ToO trigger – 1.5 Msec



Credit: NASA's Marshall Space Flight Center/Daniel Kocevski

- Unanticipated ToOs
- Through DDT time
- ToO form on IXPE project website at MSFC at [https://ixpe.msfc.nasa.gov/for\\_scientists/too.html](https://ixpe.msfc.nasa.gov/for_scientists/too.html)

## IXPE Target of Opportunity (ToO)

IXPE ToO observation requests will not be considered for events or sources that could have been predicted or proposed for in advance. If the ToO is accepted, it will take 3 calendar days or so from the time you submit this form until IXPE can slew to the target and start observing.

IXPE should not be used just to measure the X-ray flux of a source. **IXPE is intended to measure the polarization of X rays**, which requires a large number of counts. It will help your proposal if you can estimate the level of polarization you expect to see from your source. In any case, you must estimate the Minimum Detectable Polarization (MDP) you expect to achieve with this observation. Both the source count rate and MDP can be estimated using [WebPIMMS](#).

The ability to get data off the spacecraft is limited and this limits how long a bright source can be observed before we need to switch to a faint target. For example, the Crab can only be observed for 2 days before the on-board storage is filled (assuming it was empty at the start) and it will take up to a week to download the data. Therefore, proposers also need to estimate the source counting rate in the full IXPE band using [WebPIMMS](#).

Please review the [IXPE Long Term Plan](#) to see if your proposed target is not already listed.

Please check to see if your target is currently observable with IXPE using [viewing](#).

IXPE data associated with ToO requests will have **no exclusive use period** and will be available via the public archive at the HEASARC nominally within one week of completion of the observation.

In the first two years, we encourage the community to collaborate with the [IXPE science team](#). If the mission is extended a full GO program will be implemented.

Principal requester	
Name	<input type="text"/>
Institute	<input type="text"/>
Primary Email address (additional email addresses can be supplied in Remarks section below). Note, if you do not get an email sent to this address, the ToO form also was not sent to the IXPE team.	<input type="text"/>
Best way to reach me (email, phone)	<input type="text"/>
24 hr Contact info	Phone numbers etc. <input type="text"/>
Scientific Justification	
Object type	<input type="text"/>
Scientific Justification Clearly and concisely explain the need and scientific potential for this ToO.	<p>Please limit to 2000 characters.</p> <div style="border: 1px solid black; height: 100px;"></div>
	one per line

# What counts as a trigger?

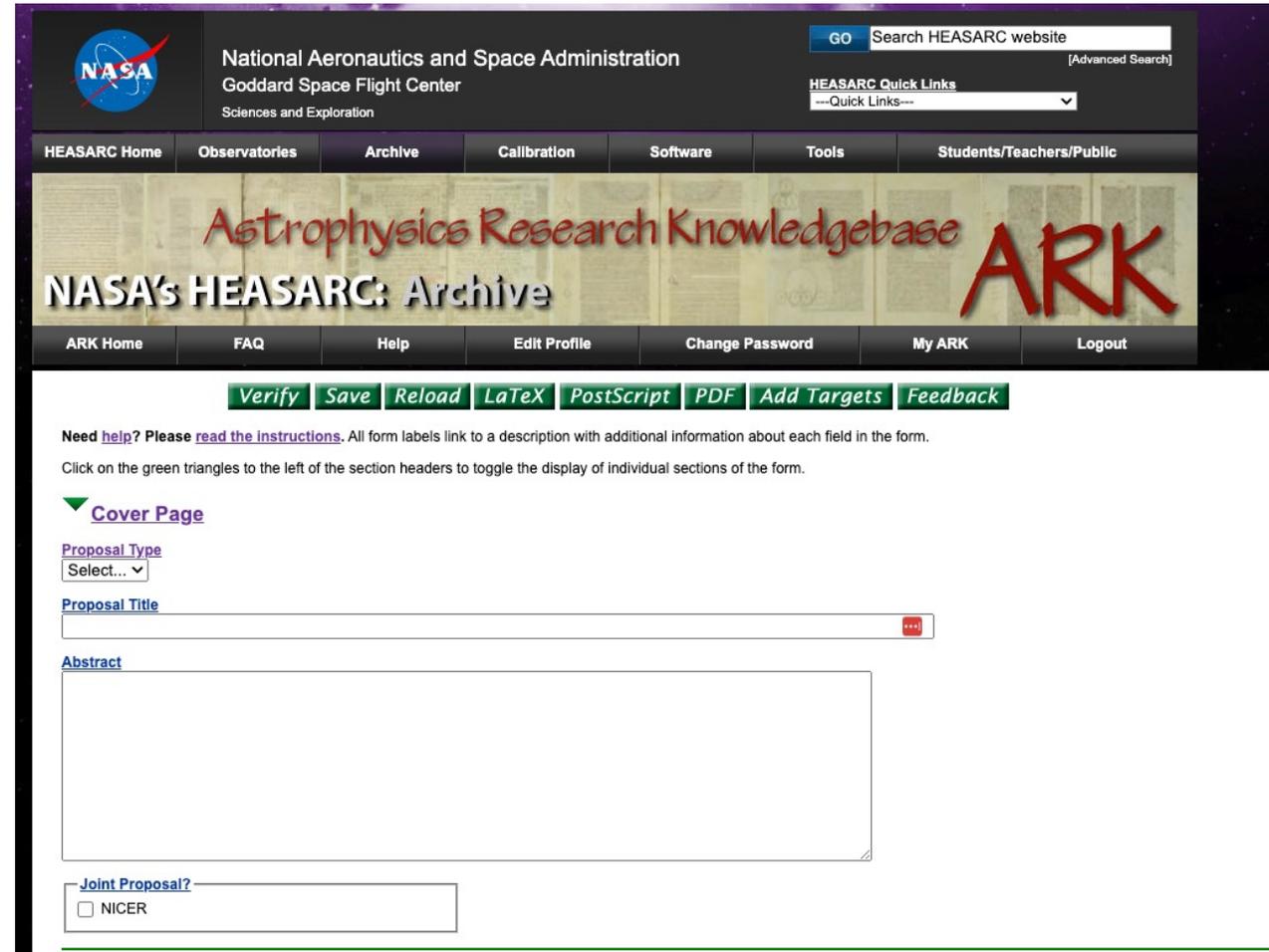
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- ToO observations might need one or multiple triggers
- Example 1: Once triggered, request observations on Days 2, 5 and 10
  - This requires one trigger (and 3 observations)
  - In such cases, details need to be well characterized
- Example 2: PI will trigger one observation in hard state and one in soft state
  - This requires two triggers
  - Each trigger requires a new ToO form

- Proposals for theoretical investigations are also solicited
- Aid in the interpretation of IXPE results
- Advance the science return of IXPE
- One year period of performance

- Accepted proposals are ranked Category A or C
- Category A guaranteed
- Category C executed on best effort basis
  - Funding available if C targets observed
- Time constrained and joint proposals need to be designated Category A
- Multi-cycle proposals not solicited

- Phase I proposal – submission through ARK/RPS
  - Scientific/Technical Justification
    - 4-page limit (incl. figures & tables)
  - 5 pages for large proposal and joint NICER proposals
  - References do not count against page limit, can use an extra page.
  - Expertise and resources document



The screenshot shows the NASA HEASARC Archive website. At the top, there is a NASA logo and the text "National Aeronautics and Space Administration, Goddard Space Flight Center, Sciences and Exploration". A search bar is present with the text "GO Search HEASARC website" and a link to "[Advanced Search]". Below the search bar is a "HEASARC Quick Links" dropdown menu. A navigation bar contains links for "HEASARC Home", "Observatories", "Archive", "Calibration", "Software", "Tools", and "Students/Teachers/Public". The main header features the text "Astrophysics Research Knowledgebase" and "NASA's HEASARC: Archive" in a stylized font, with a large "ARK" logo on the right. A secondary navigation bar includes "ARK Home", "FAQ", "Help", "Edit Profile", "Change Password", "My ARK", and "Logout". Below this is a row of buttons: "Verify", "Save", "Reload", "LaTeX", "PostScript", "PDF", "Add Targets", and "Feedback". The main content area contains instructions: "Need help? Please read the instructions. All form labels link to a description with additional information about each field in the form. Click on the green triangles to the left of the section headers to toggle the display of individual sections of the form." The "Cover Page" section is expanded, showing a "Proposal Type" dropdown menu (set to "Select..."), a "Proposal Title" text input field with a red "X" icon, and an "Abstract" text area. At the bottom, there is a "Joint Proposal?" section with a checkbox for "NICER".

- Must estimate MDP
  - Use measured polarization from similar sources from IXPE publications
  - Use a theory that predicts polarization
- Justify any time constraints
  - Make sure time constraints do not conflict with visibility windows

- Scientific justification anonymized
- Expertise & Resources – not anonymized
  - Only seen by panel after ranking

- Phase II (budgets) - through NSPIRES
  - PIs will be emailed invitation to submit budgets
- Details of fair share amount will be included with invitation

- For questions about IXPE, datasets or the GO program, visit the help desk on the GOF website: <https://heasarcdev.gsfc.nasa.gov/docs/ixpe/>
- We are looking for volunteers for the review panels!
  - Please email [Kavitha.arur@nasa.gov](mailto:Kavitha.arur@nasa.gov) if you are interested.

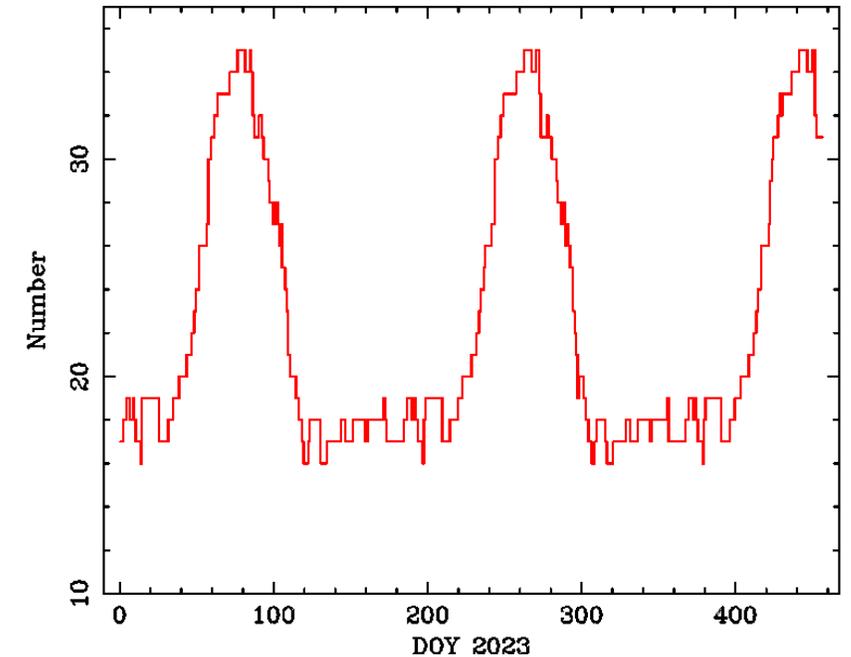
# Special Considerations for IXPE proposals

- Need lots of counts to measure polarization
- Two main ways to get these counts:
  - Long observation of a faint source
    - Observations  $\geq 1$  Msec are welcomed and encouraged!
  - Shorter observation of a bright source
    - Duration of observation will be limited by the telemetry constraints
    - Observation will be broken up by looks at faint sources

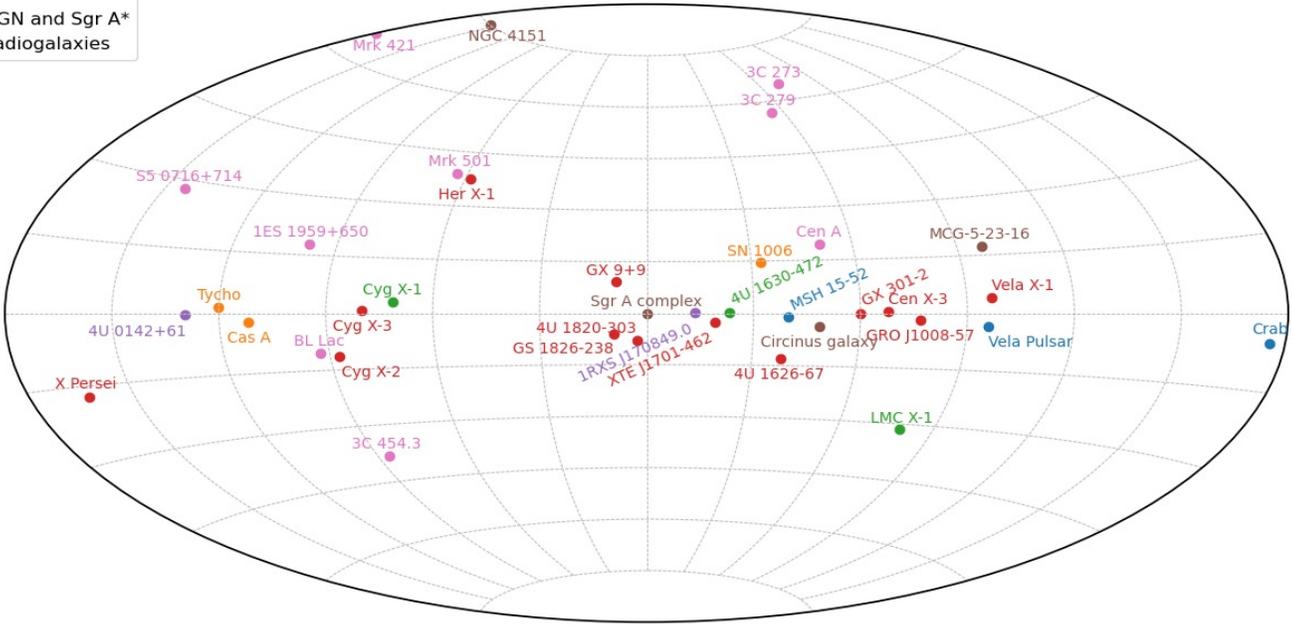
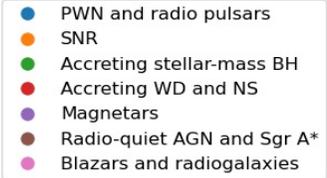
- Since IXPE takes a picture of every charge cloud produced
  - This produces more data (average is 1.6 kb/event) per photon than other X-ray missions
  - Limited on-board storage (4 GB total)
  - The equatorial orbit limits number of ground stations
    - One main (Malindi)
    - One backup (Singapore)
- This puts a restriction on how long we can observe a bright source
  - Roughly 75 ksec for the Crab
- Thus, long observations of bright sources must be broken up with observations of dimmer sources to get the telemetry down
  - Otherwise, we risk data loss

- What happens if you ask for 150 ksec on a 1-Crab source
  - The Science Operations Center (SOC) will split the observation in two “segments”
  - The SOC will make every attempt to put both segments in the same 6-month observing window
  - The data will be released when all segments complete
    - Note, if the observations cannot be completed in one window then the data will be released when the 6-month observing window closes
- If you ask for two 75 ksec observations, then
  - You will get the data from each observation when it completes

- IXPE can only look  $90 \pm 25$  degrees from the Sun
- This restricts when targets can be observed
- Figure shows the number of year 2 targets that can be observed on any given day
  - We plan to flatten this curve in GO program



- The Galactic Center is a very popular place for IXPE targets
- Much competition for the Feb-01 to May-01 window
- May-01 to Aug-01 have had less competition
- Cycle repeats every 6 months



Thank you!